

quality or clarity should improve sufficiently to enable seagrass to expand to the 1943 depth coverage. In the near future, application of the PLR Model will help ascertain whether these provisional targets are reasonable or too stringent.

Table 3-2. Provisional “allowable” loading rates of TN, TP, and TSS for Mosquito Lagoon based on estimated 1943 land cover loading rates
(see Figure 3-1 or Figure 3-2 for map location of segments)

<i>Segments</i>	<i>TN</i> lb/ac/yr (total lb/yr)	<i>TP</i> lb/ac/yr (total lb/yr)	<i>TSS</i> lb/ac/yr (total lb/yr)
N. Mosquito Lagoon ML1	2.6 (44,659)	0.30 (5,254)	55 (946,470)
C. Mosquito Lagoon ML2	2.0 (17,520)	0.20 (1,509)	35 (300,685)
S. Mosquito Lagoon ML3-4	1.0 (33,822)	0.1 (4,437)	13 (493,100)

Land Acquisition. Acquiring lands is an important strategy to protect or restore wetlands (refer to the Coastal Wetlands sections in this and other chapters), but it can also be effective in mitigating pollutant loads – present and future. For example, the SJRWMD can assist local governments in acquiring lands that would be a necessary pre-requisite to constructing municipal or regional stormwater treatment systems. And, of course, upland parcels, purchased as a means of acquiring wetlands, can be preserved or managed in ways that will preclude or minimize development and future pollutant load increases.

For specific information on what lands in the Mosquito Lagoon basin are identified for purchase or “less-than-fee” acquisition under the IRL *Blueway* Project, refer to the Coastal Wetlands section in this chapter, pp. 3-15, and Chapter 2, Figure 2-11.

Coordination with Other Agency Plans. The IRLNEP, FDEP and EPA (section 319 non-point source reduction grant program), and the SJRWMD jointly review projects and combine cost-share dollars to financially support local projects. This is the case most recently with stormwater projects in New Smyrna Beach (see non-point source reduction strategies above). The SJRWMD will also fund additional local projects deemed appropriate under its local government assistance and IRL license plate programs.

The SJRWMD is encouraged by the planned activities covered in the Canaveral National Seashore’s *Water Resources Management Plan* (2001). This plan not only proposes to tackle water resource issues within the Park boundaries -- which covers much of the central and southern Mosquito Lagoon (segments ML2 and ML3-4) -- but also states the need to coordinate with other agencies on improving the management of land use and user activities throughout the watershed to better protect park resources. For example, as stated in its plan, the Park is interested in conducting cooperative studies on possible

impacts to seagrass and water quality (e.g., septic tank discharge, and commercial and recreational uses in Mosquito Lagoon). The SJRWMD has reviewed the plan with Park staff for possible collaboration on such studies, particularly those that may help answer some questions relative to the troubling water quality trends revealed in the southern Mosquito Lagoon.

The Next 5 Years

Strategies for Pollutant Load Reduction.

Non-point Source Strategy – Surface Water Drainage. Over the next 5 years, the SJRWMD and IRLNEP will be looking to expand the non-point source program throughout New Smyrna Beach and develop such cooperative projects in other communities, including Edgewater and Oak Hill.

Non-point Source Strategy – Muck. A new bottom survey of muck deposits in the southern Mosquito Lagoon should be conducted within the next 3 years, especially in view of the fact that TSS and TN concentrations showed dramatic increases there in the last few years. The last survey was done 11 years ago. If the new survey reveals an appreciable expansion of muck deposits, then a proposal to accelerate the Intracoastal Waterway (ICW) maintenance schedule can be submitted to the U.S. Army Corps of Engineers (USACE). The USACE has scheduled maintenance dredging of the ICW over the next 4 to 5 years (contingent upon congressional appropriations). However, the new bottom survey and the USACE/District IRL-North Feasibility Study may serve to accelerate the schedule and/or leverage a specific budget appropriation.

Non-Point Source Strategy – Septic Tanks (a.k.a. OSDS). Volusia County and the mainland communities such as Oak Hill should renew efforts to expand centralized wastewater treatment service into septic tank or OSDS areas. The potential for OSDS contamination by certain mainland areas is high and those areas should also be considered for “hook-up” as soon as a centralized sewer service is available (Volusia County, 1993).

Point Source Strategy – Domestic Wastewater Treatment Plants. The two WWTPS temporarily exempted from the IRL “No Discharge” Act⁵ -- New Smyrna Beach and Edgewater – intend to comply in the near future as soon their treatment system upgrades are constructed and reuse systems are functional. The anticipated reductions in pollutant loadings from these WWTPs will mean that point source loadings to the Mosquito Lagoon could be regarded as negligible. Water quality restoration efforts can then focus on the management of surface water drainages and the Lagoon’s internal processes that may exacerbate turbidity levels.

Monitoring, Modeling, and Applied Studies. The SJRWMD, Volusia County, and NASA will continue the seagrass and water quality monitoring networks. The SJRWMD will also evaluate and refine the networks to strengthen empirical relationships among water quality, light, and the depth coverage of seagrass. Periodic reporting of status and trends will key in on those major optical pollutants that are significant in the Mosquito Lagoon; with special attention paid to TSS and nutrients. A re-survey of muck

⁵ Chapter 90-262, Laws of Florida

sediments and a reconnaissance of major upland sources of TSS and TN are recommended⁶.

The SJRWMD may further investigate possible causes for the dramatic seagrass loss in northern Mosquito Lagoon (ML1) near New Smyrna Beach. It seems that there may be other limiting factors besides those related to light limitation (e.g., hydrodynamics, unstable sediments, dredged depths below 1.7 m).

The PLR Model is scheduled for completion at the end of 2002. That will be followed by the application of the model in the development of *final* recommended PLRGs for Mosquito Lagoon by end of 2004.

Land Acquisition. For planned activities please refer to the Coastal Wetlands, Land Acquisition section in this chapter, pp. 3-15.

Coordination with Other Agency Plans. The SJRWMD and Canaveral National Seashore will collaborate on seagrass/water quality research as it relates to the causes or processes responsible for the troubling turbidity and nitrogen levels in the southern Mosquito Lagoon. The IRL-North Feasibility Study (USACE and SJRWMD, 2002) may offer additional federal support for recommended research as well as for remedial action, for example, muck removal from the Intracoastal Waterway.

Table 3-3. The 5-Year Plan List of Seagrass and Water Quality Projects for the Mosquito Lagoon

- **Continue monitoring in the Mosquito Lagoon as part of the Lagoon-wide monitoring networks***
 - **Water Quality Monitoring (Volusia County, NASA, SJRWMD)**
 - **Seagrass Mapping and Field Monitoring**
 - **Meteorological Monitoring**
 - **Hydrodynamic Monitoring**
 - **Atmospheric Nutrient Deposition Monitoring**
- **Develop final PLRGs by 2004**
- **Implement non-point, surface water projects aimed at reduction of nutrient and TSS loadings (Volusia County, New Smyrna Beach, Edgewater, and Oak Hill)**
- **Re-survey muck deposition areas**
- **Continue periodic inventory of domestic WWTPs**
- **Continue to support actions by local gov'ts and Canaveral National Seashore in the remediation of septic tank contamination areas (potential or actual)**
- **Pursue acquisition of lands identified under the *Blueway* program**
- **IRL – North Feasibility Study (USACE/SJRWMD)**
- **Identify major constituent(s) that contribute to Mosquito Lagoon's turbidity**
- **Identify other factors that could limit seagrass distribution, especially in segment ML1 (other than turbidity/light)**

* descriptions of monitoring networks are found in Chapter 2, and listed in Table 2-4.

⁶ In addition, Lagoon-wide investigations in sediment particle re-suspension and the optical properties of various types of suspended material may provide major clues as to what type of suspended material most influences turbidity and light penetration. That knowledge may be important in targeting tighter controls on very specific sources of TSS.

Coastal Wetlands

Mosquito Lagoon contains about 20,000 acres of salt marsh wetlands. Over 6,750 acres of marsh is impounded; the remaining acreage is the largest un-impounded acreage in the IRL system (Figure 3-4). Most of the impounded marshes are actively managed by USFWS; the remaining impoundments have been restored or breached and do not require management. The vast majority of the impounded marshes are publicly owned; therefore, private ownership is not an issue in their rehabilitation and management.

Mosquito Lagoon also has the largest acreage of dragline-impacted marsh – nearly 1,300 acres (Figure 3-4). A small portion of these wetlands is privately owned and will probably need to be publicly acquired in order to accomplish any rehabilitation. Rehabilitation of the dragline-impacted wetlands will be jointly managed between SJRWMD and E. Volusia Mosquito Control District.

Progress on Projects

Please refer to the Coastal Wetlands section in Chapter II for a description of the general background and scope of the projects. What is provided below is strictly progress information.

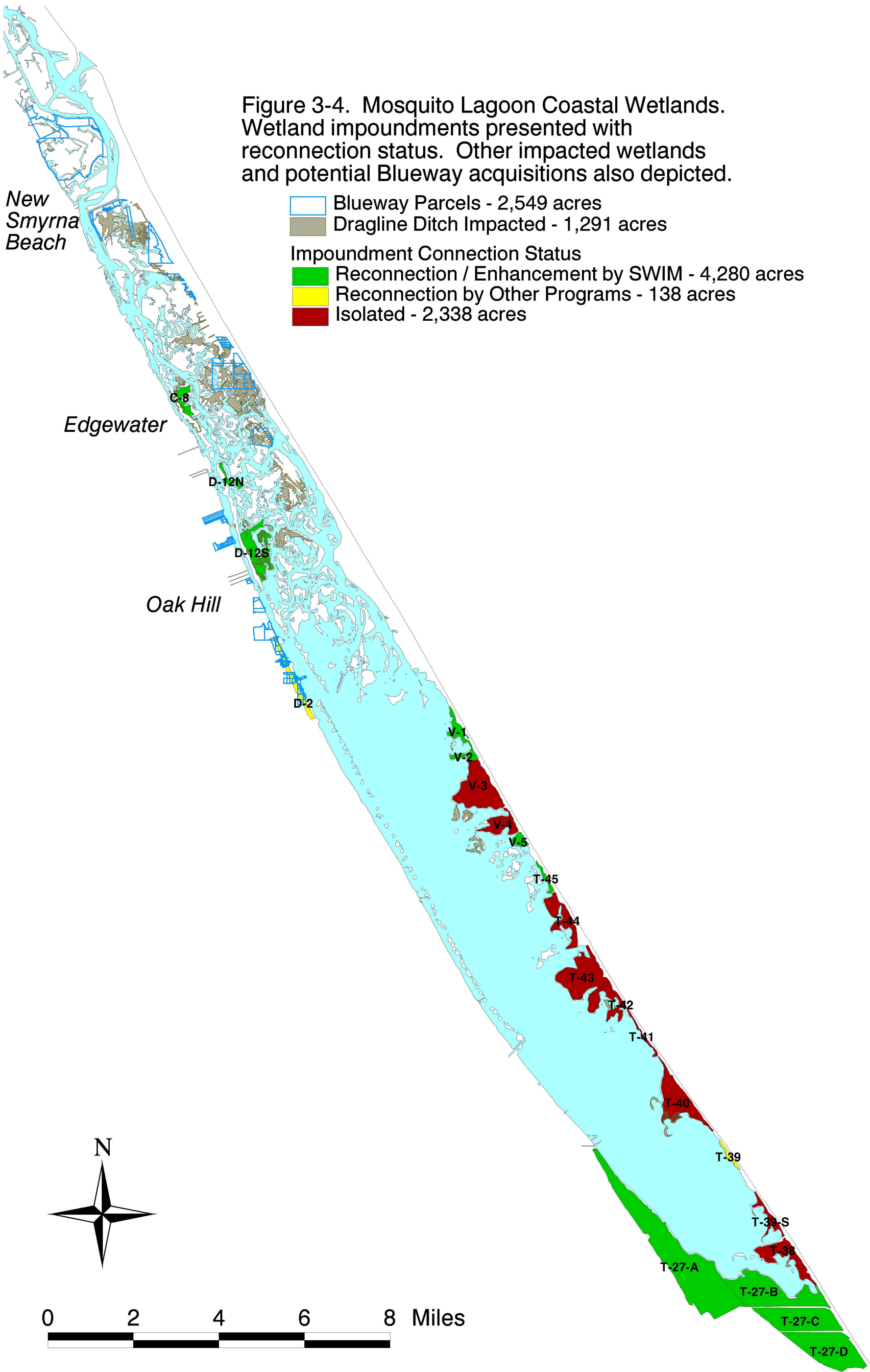
Rehabilitation of Impounded Wetlands. All of the impoundments in Mosquito Lagoon outside of the Merritt Island National Wildlife Refuge have been breached or reconnected. Within the Refuge-managed area of Volusia County, four of the impoundments were restored (V-1, V-2, V-5, and T-45) and the remaining two will be reconnected (V-3 and V-4). With the exception of T-39 (restored), all of the barrier island impoundments in Mosquito Lagoon/Brevard County are targeted for future reconnection or restoration. The impoundments around the south and west shores of Mosquito Lagoon (T-27s in Brevard County) were reconnected.

In summary, about 4,420 acres of wetlands were reconnected, breached, or restored in Mosquito Lagoon.

Wetlands Management Research Initiative. Even though the Research Initiative is not being conducted in Mosquito Lagoon, its results and recommendations can be considered in the management of reconnected impoundments throughout Mosquito Lagoon.

Rehabilitation of Other Impacted Wetlands – Dragline-Ditch Impacts. The pilot project to evaluate equipment and technique options in the rehabilitation of dragline-ditched wetlands should be completed by the time this plan update is published. The pilot project takes in Orange and Porkchop islands in Mosquito Lagoon, a combined area of 56 acres. The pilot project will provide practical results that will be applied to the planning of full-scale operations in Mosquito Lagoon. These operations will rehabilitate the 1,291 acres of dragline-ditched island wetlands in Mosquito Lagoon (Figure 3-4).

Figure 3-4. Mosquito Lagoon Coastal Wetlands. Wetland impoundments presented with reconnection status. Other impacted wetlands and potential Blueway acquisitions also depicted.



Creation of Shoreline Vegetative Habitats. The project dealing with red mangrove (*Rhizophora mangle*) plantings is not conducted in Mosquito Lagoon because this area is the species' northern limit in range. Plantings of red mangrove may not survive the colder winters in Mosquito Lagoon and North IRL as compared to milder winters in Central and South IRL.

Relatively small planting projects involving cordgrass (*Spartina alterniflora*) and black mangrove (*Avicennia germinans*) have taken place as part of some stormwater treatment/erosion control projects (e.g., New Smyrna Beach Riverside Drive projects).

Preservation of Existing Wetlands – Land Acquisition. Most of the wetlands are in public ownership; therefore, land acquisition is not a major issue in Mosquito Lagoon as it is in the Indian River proper. Nonetheless, there are 2,549 acres of wetlands in the North and Central Mosquito Lagoon included in the IRL *Blueway* Project (Figure 3-4). In 1999, SJRWMD entered into a contract with The Nature Conservancy to provide assistance with this acquisition program. Though no properties have been purchased under the *Blueway* Project to date, owner responses indicate a high percentage of willing sellers. A map of land parcels identified for potential acquisition under *Blueway* is also found in Chapter 2, Figure 2-11.

The Next 5 Years

Rehabilitation of Impounded Wetlands. The goal over the next 5 years is to reconnect all the remaining isolated impoundments on the barrier island in Mosquito Lagoon – over 2,300 acres. The objective for the next year or two is to complete the work in on the “V” impoundments currently under contract with the U.S. Fish and Wildlife Service and E. Volusia Mosquito Control District.

Wetlands Management Research Initiative. The same agencies that manage wetlands in Mosquito Lagoon are involved in or are being made aware of the Research Initiative: USFWS, Canaveral National Seashore, and E. Volusia Mosquito Control District. These agencies can readily apply the research findings to their respective management policies and programs that affect impounded wetlands in this lagoon. It is expected that they will participate in the development of final management recommendations, which should begin within the next 3 years.

Rehabilitation of Other Impacted Wetlands – Dragline-Ditch Impacts. A plan to rehabilitate ~1,290 acres of dragline-ditched impacts in Mosquito Lagoon should be developed within the year. The plan will scope out what can be practically achieved within budget year time frames. It's possible that the USACE, under the IRL-North Feasibility Study, may be able to significantly contribute toward this project. But it's not possible at this time to realistically determine how much of the plan can be implemented in 5 years. Some of the impacted wetlands are privately held and will need to be acquired to enable their rehabilitation.

Creation of Shoreline Vegetative Habitats. There are no plans (nor a compelling reason) for creating wetland habitat or conducting any major planting in Mosquito Lagoon.

Preservation of Existing Wetlands – Land Acquisition. The objective for the next five years is to acquire as much of the 2,549 acres of wetlands identified in the *Blueway* Project plan. Acquisition support services should be maintained to help ensure success. There are several willing sellers that could be contacted to negotiate acquisition agreements.

Table 3-4. The 5-Year Plan List of Coastal Wetland Projects for the Mosquito Lagoon

- **Reconnect/restore all remaining isolated impoundments (~2,300 acres)**
- **Initiate a plan to rehabilitate the ~1,290 acres of dragline-impacted wetlands**
- **Elicit federal support of wetland restoration activities via the USACE/SJRWMD IRL-North Feasibility Study**
- **Pursue acquisition of the 2,549 acres of wetlands and uplands identified under the *Blueway* program**

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